Landsat 7 Processing System
Consent to Ship Review

July 21, 1997

LPS Consent to Ship Review

Agenda

- **Introduction**
- **System Configuration**
- **Maintenance/Hardware Support Items**
- **System Performance Review**
- **System Test Status Report**
- **Software Support Items**
- **Documentation**
- **Training**
- **Facility Status (EDC)**
- **Open Issues/Work-Off Plans**
- **Conclusion**

LPS Consent to Ship Review

Introduction

- **Purpose**
  - **To review LPS compliance with documented Acceptance Criteria**
  - **To identify areas of non-compliance**
    - **Present known areas of non-compliance and work-off plans**
    - **Identify any new areas of non-compliance and develop an agreed upon work-off plan**
- **Outcome of the meeting**
  - **Decision on LPS Shipment**
    - **Agreement to ship the LPS**
      - **Decision to ship is made if the LPS meets the criteria and we have mutual agreement on a work-off plan for the areas of non-conformance**
    - **Agreement to NOT ship the LPS**
      - **Decision not to ship is made if LPS does not meet the criteria and we do not have mutual agreement on a work-off plan for areas of non-compliance**
      - **Identify actions that need to be completed before agreement for shipment can occur**
  - **List of action items/open issues with assigned actionees and due dates**

LPS Consent to Ship Review

Plan for LPS CCR/ICCR Resolution

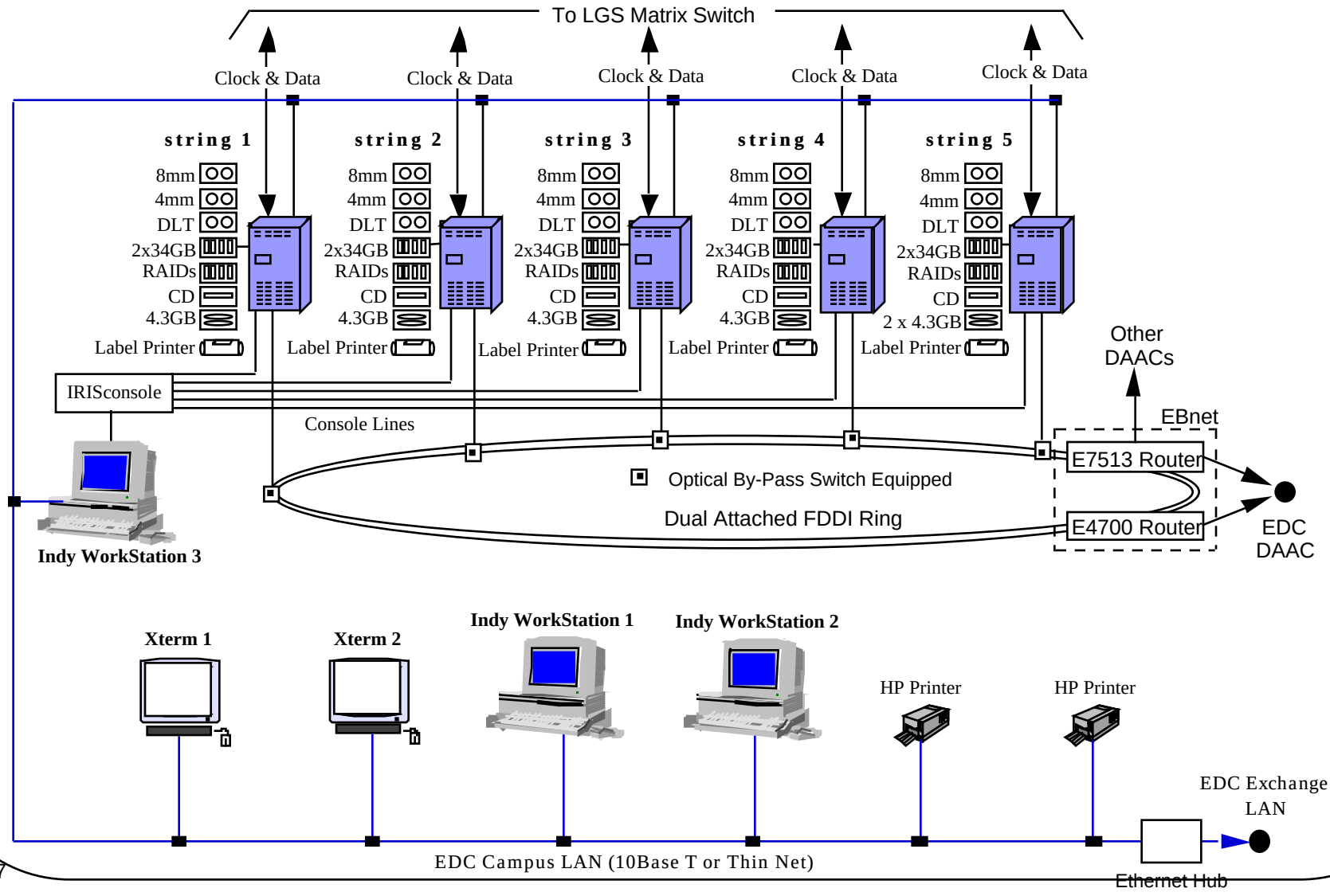
- **Meeting was conducted with EDC/GSFC personnel to review all open problem reports and enhancements documented in the ICAS system**
- **Completed initial prioritization and plan for two maintenance builds**
- **Many items were identified as fixed yet not included in the Release 2 Software turnover package to System Test for verification**
  - **Plan for closure of these items needs to be developed and reviewed by EDC personnel (see action item)**
- **CNMOS to:**
  - **Review analysis of problems identified for each release**
  - **Provide proposed schedule**
  - **Provide final list or problems to be fixed**
- **Schedule and release contents to be reviewed/approved by GSFC.**

LPS Consent to Ship Review

Agenda

- Introduction
- System Configuration
- Maintenance/Hardware Support Items
- System Performance Review
- System Test Status Report
- Software Support Items
- Documentation
- Training
- Facility Status (EDC)
- Open Issues/Work-Off Plans
- Conclusion
- Backup Slides

LPS Consent to Ship Review



LPS Consent to Ship Review

System Configuration (Cont.)

SHIPPING EQUIPMENT LIST

ITEM	DESCRIPTION		QTY	UNIT	ECN NO.
1	SGI CHALLENGE XL COMPUTERS		5	EA	
	S/N: S39406	(String1)			1523925
	S/N: S46910	(String2)			1816994
	S/N: S46911	(String3)			1816993
	S/N: S46908	(String4)			1816996
	S/N: S37891	(String5)			1422266
2	EQUIPMENT RACKS		5	EA	
	(Each rack contents two (2)	(String1)			N/A
	Ciprico RAIDs and one (1)	(String2)			N/A
	BoxHill MDL1C-7-DLT4	(String3)			N/A
	Media Changer) (see note 1)	(String4)			N/A
		(String5)			N/A
3	SGI INDY WORKSTATIONS DISPLAYS		3	EA	
	S/N: 2475339	(L7Indy #8)			1700455
	S/N: 2475336	(L7Indy #9)			1700300
	S/N: 2404317	(L7Indy #3)			1422249
4	SGI INDY WORKSTATIONS BASES		3	EA	
	S/N: 08006909EEE9	(L7Indy #8)			1700299
	S/N: 0800690A36C8	(L7Indy #9)			1700452
	S/N:080069089491	(L7Indy #3)			1422248

LPS Consent to Ship Review

System Configuration (Cont.)

SHIPPING EQUIPMENT LIST CONT.

ITEM	DESCRIPTION	QTY	UNIT	ECN NO.
5	NCD X-TERMS	2	EA	
	S/N: 410199-179			1532590
	S/N: 410199-174			1532588
6	NCD X-TERMS BASES	2	EA	
	S/N: 0995T002544			1532587
	S/N: 0995T002552			1532586
7	CABLES	2	EA	N/A
8	MISC	2	EA	N/A
9	EPSON PRINTERS (LQ-570+)	5	EA	
	S/N: 1F8E567833			1817001255
	S/N: 1F8E567827			1816999255
	S/N: 1F8E567830			1816998255
	S/N: 1F8E567826			1816997255
	S/N: 1F8E441825			1816995255
10	HP LASERJET PRINTERS	2	EA	
	S/N: USLB010750			1755022
	S/N: USLB010751			1755021
11	MATRIX SWITCH			
	S/N:129791	1	EA	1529369
12	DOCUMENTATION BOX	1	EA	N/A
13	ETHERNET HUB	1	EA	1817005
	LanCast 4422 SuperHub			
	24 Ports S/N:6577600083			
14	IRISconsole Unit	1	EA	1750903

LPS Consent to Ship Review

System Configuration (Cont.)

SHIPPING EQUIPMENT LIST CONT

Equipment Rack	Subsystem Model and S/N	ECN No.
LPS STRING 1	Ciprico RAID Model AR6712 - S/N: 001920	1529135
	Ciprico RAID Model AR6712 - S/N: 001919	1529136
	BoxHill MDLC1-7-DLT 4 - S/N: 55787	1816987
LPS STRING 2	Ciprico RAID Model AR6712 - S/N: 002664	17700919
	Ciprico RAID Model AR6712 - S/N: 002659	17700920
	BoxHill MDLC1-7-DLT 4 - S/N: 55783	1816992
LPS STRING 3	Ciprico RAID Model AR6712 - S/N: 002660	17700924
	Ciprico RAID Model AR6712 - S/N: 002663	17700925
	BoxHill MDLC1-7-DLT 4 - S/N: 55786	1816991
LPS STRING 4	Ciprico RAID Model AR6712 - S/N: 002662	17700923
	Ciprico RAID Model AR6712 - S/N: 002661	17700922
	BoxHill MDLC1-7-DLT 4 - S/N: 55785	1816990
LPS STRING 5	Ciprico RAID Model AR6712 - S/N: 001915	1529137
	Ciprico RAID Model AR6712 - S/N: 001916	1529138
	BoxHill MDLC1-7-DLT 4 - S/N: 55782	1816988

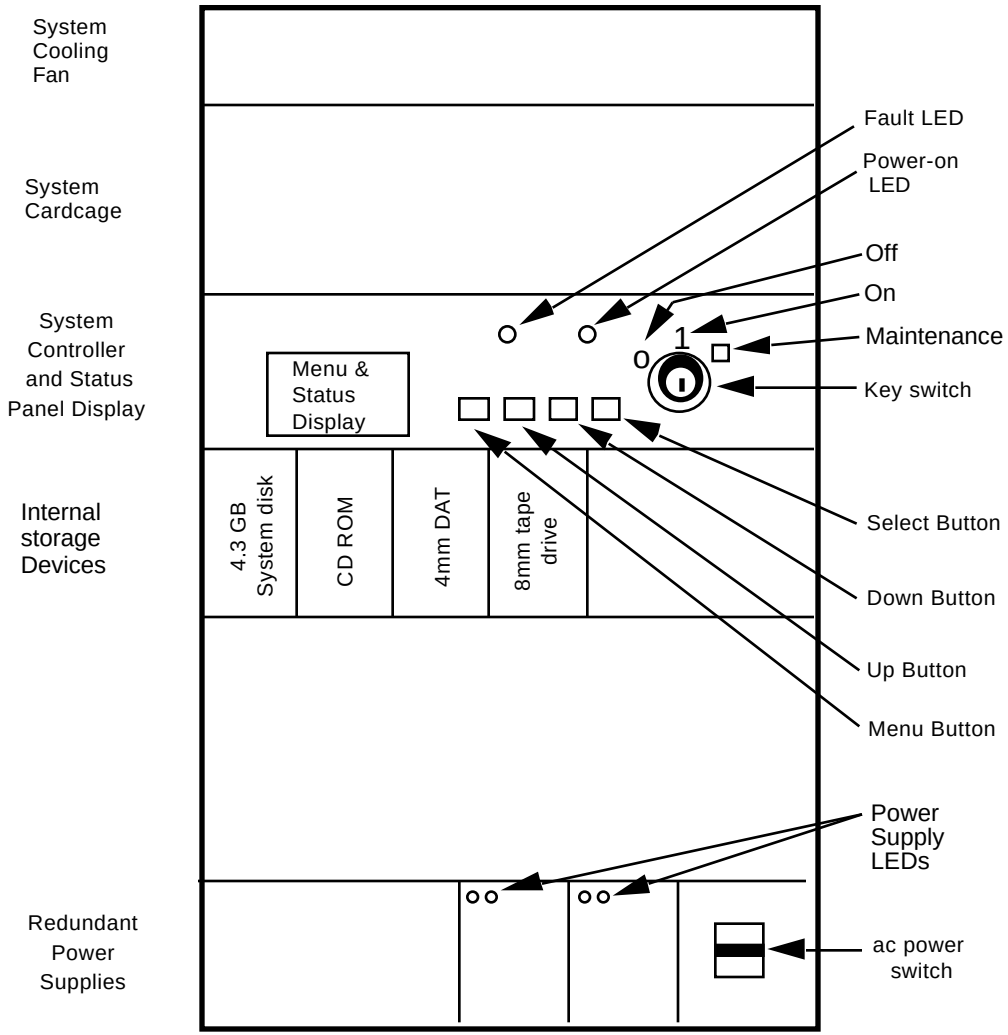
24 Ports Ethernet Hub

- **The LANCAST model 4392 12 port 10 Base-T ethernet hub will be replaced by a LANCAST model 4422 24 port 10 Base-T ethernet SuperHub.**
- **This change will allow for easy expandibilty should the need arise for additional 10 Base-T connectivity.**
- **The LANCAST model 4422 hub features a standard AUI interface.**

LPS Consent to Ship Review

System Configuration (Cont.)

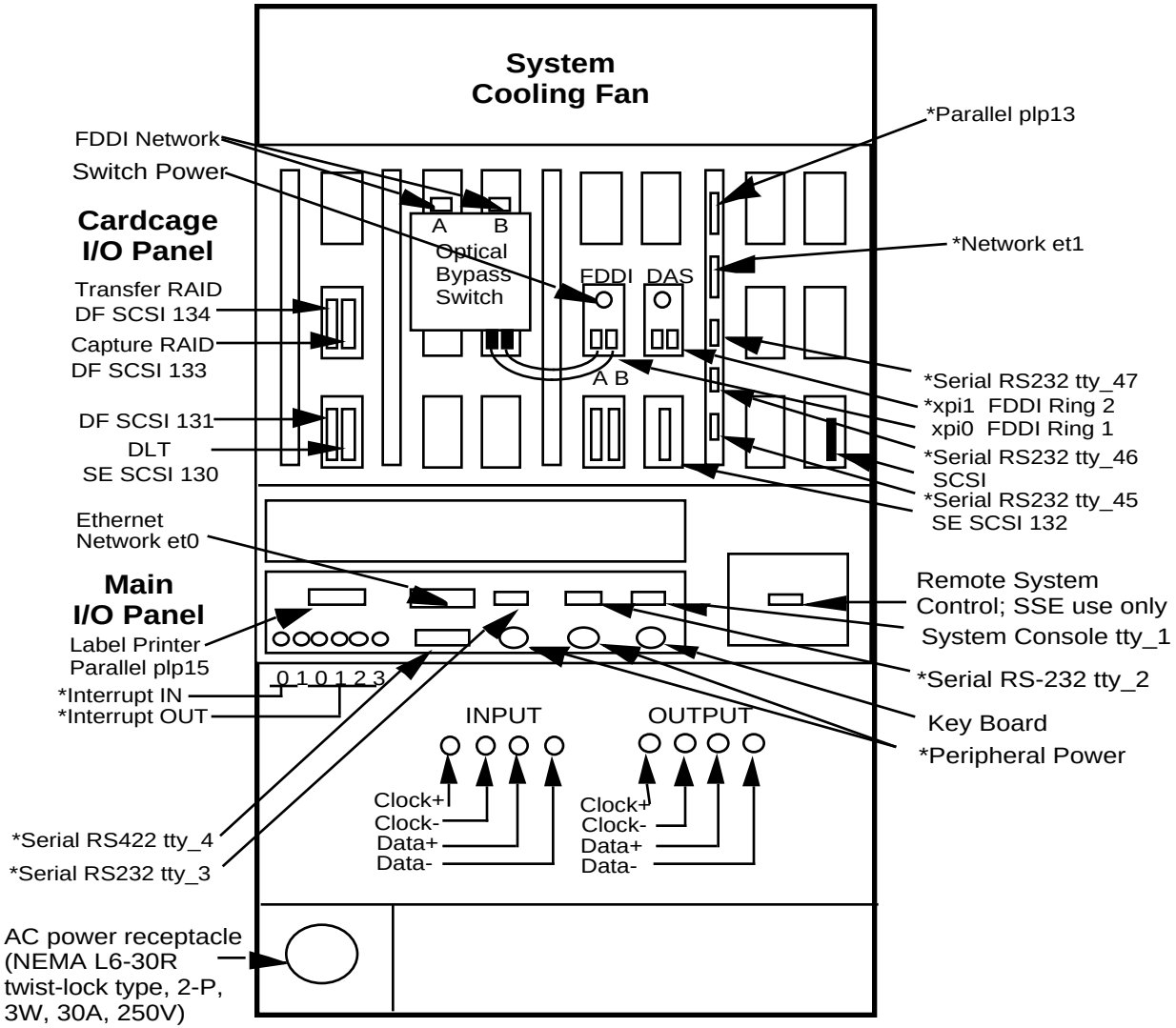
Challenge XL (front view with doors open)



LPS Consent to Ship Review

System Configuration (Cont.)

Challenge XL (rear view with doors open)

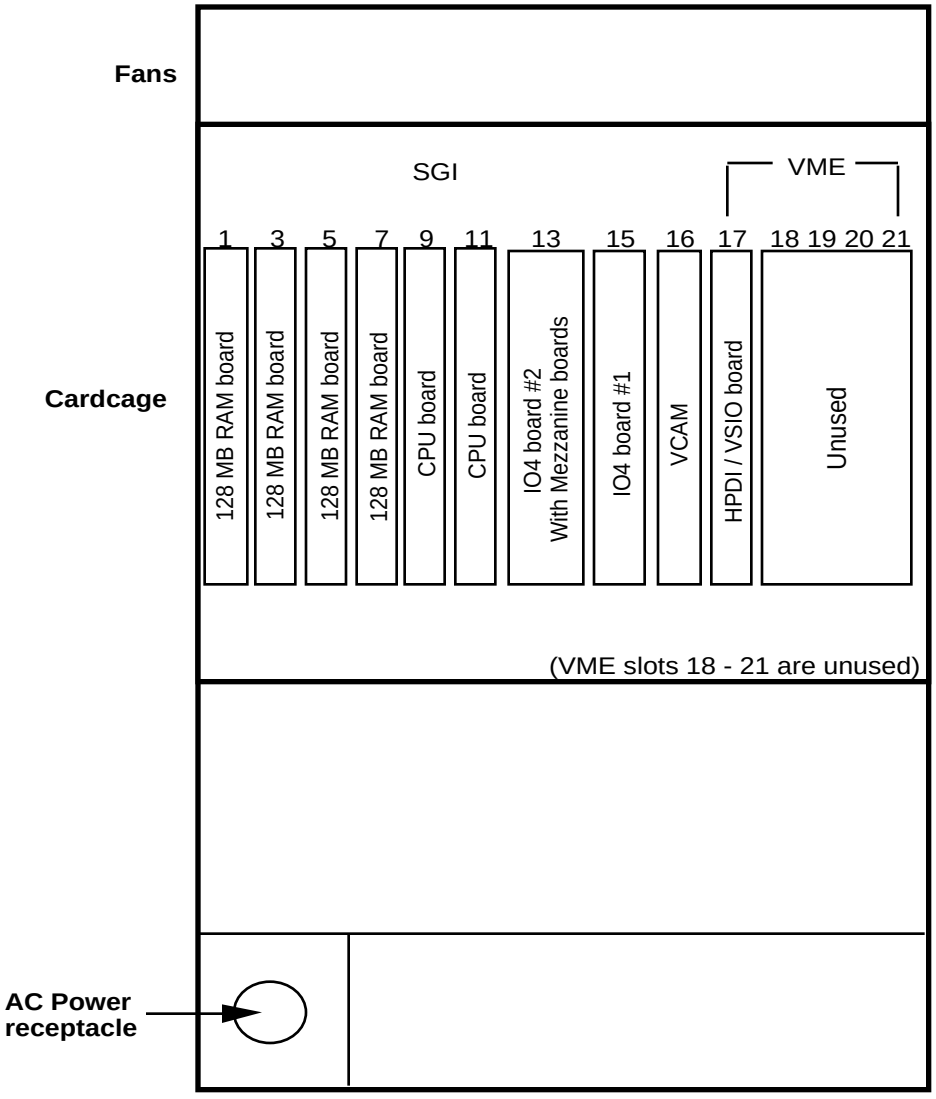


* indicates not used in operational configuration

LPS Consent to Ship Review

System Configuration (Cont.)

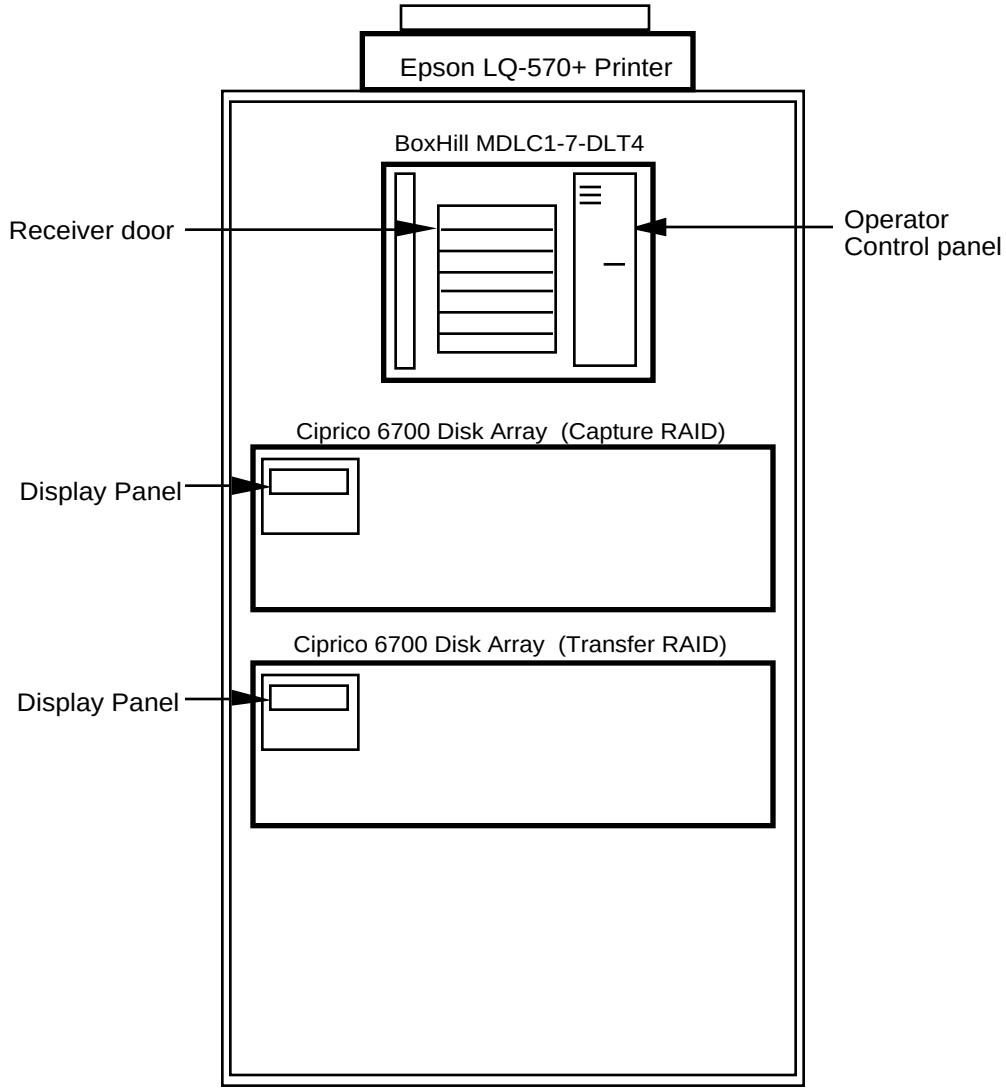
Challenge XL (rear view of cardcage)



LPS Consent to Ship Review

System Configuration (Cont.)

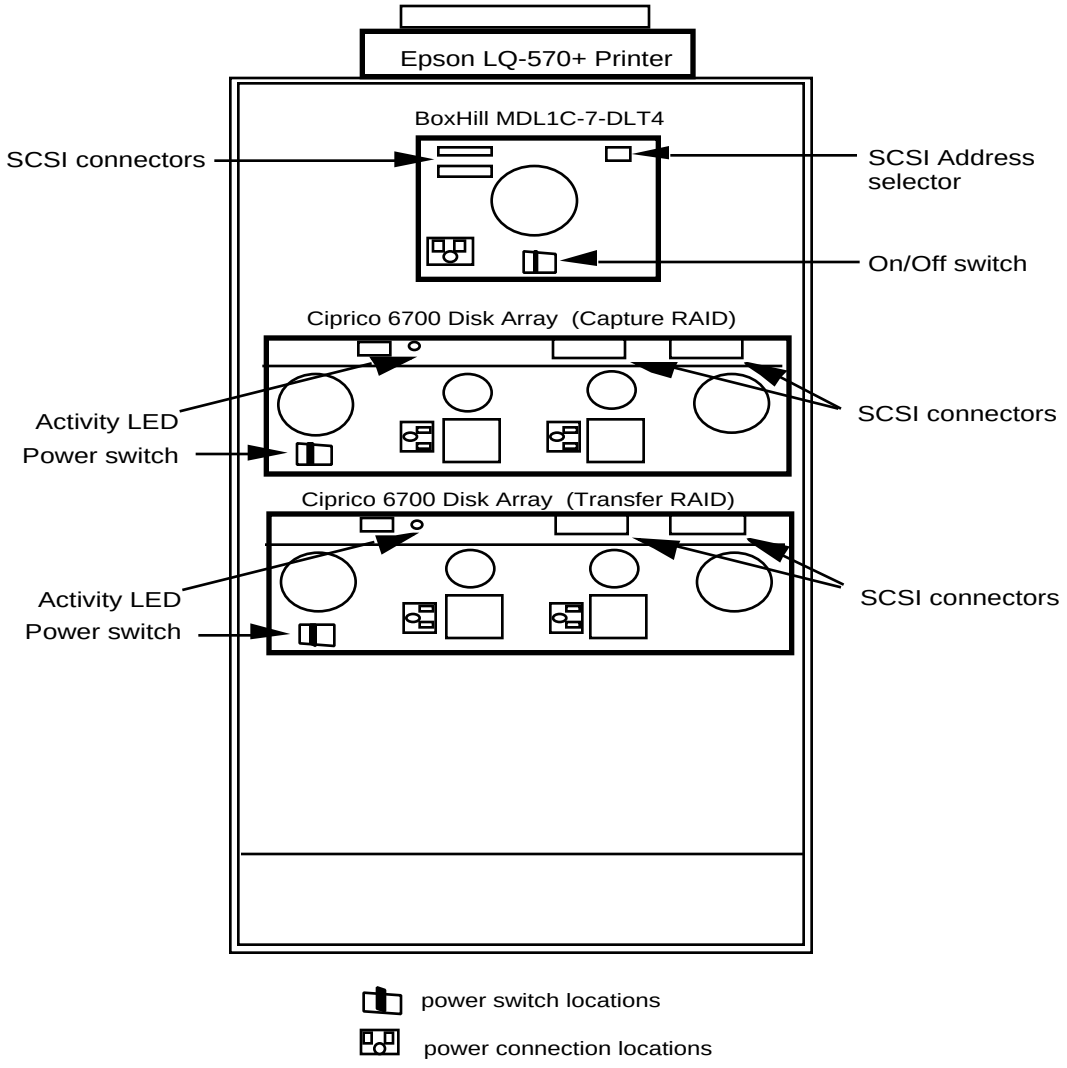
RAIDs/DLT Cabinet (front view)



LPS Consent to Ship Review

System Configuration (Cont.)

RAIDs/DLT Cabinet (rear view)



LPS Consent to Ship Review

Agenda

- Introduction
- System Configuration
- Maintenance/Hardware Support Items
- System Performance Review
- System Test Status Report
- Software Support Items
- Documentation
- Training
- Facility Status (EDC)
- Open Issues/Work-Off Plans
- Conclusion
- Backup Slides

LPS Consent to Ship Review

- **Hardware Maintenance**
  - **All SGI Equipment is currently under full maintenance support**
  - **All Ciprico Equipment is currently under full maintenance support**

LPS Consent to Ship Review

SGI MAINTENANCE STATUS

Serial #	Type	(name)	EXP. DATE	ACTIVE
S39460	CHAL XL	(LPS001)	(5/31/98)	YES
S46910	CHAL XL	(LPS002)	(3/31/98)	YES
S46911	CHAL XL	(LPS003)	(3/14/98)	YES
S46908	CHAL XL	(LPS004)	(3/14/98)	YES
S37891	CHAL XL	(LPS005)	(1/14/98)	YES
080069089491	INDY	(L7INDY3)	(1/14/98)	YES
08006909EEE9	INDY	(L7INDY8)	(3/14/98)	YES
0800690A36C8	INDY	(L7INDY9)	(3/14/98)	YES

LPS Consent to Ship Review

CIPRICO MAINTENANCE STATUS

LPS SERVER	CHASIS S/N	MODEL #	EXP. DATE
LPS001	001920	AR6712	9/11/97
	001919	" "	" "
LPS002	002664	AR6712	9/11/97
	002659	" "	" "
LPS003	002660	AR6712	9/11/97
	002663	" "	" "
LPS004	002662	AR6712	9/11/97
	002661	" "	" "
LPS005	001915	AR6712	9/11/97
	001916	" "	" "

Spare Parts List

	SYSTEM	PART NAME	QTY
–	CHALLENGE XL	HPDI/VSIO	TBD
–	CIPRICO (RAID)	8+1 DISK CONTROLLER	2
–	CIPRICO (RAID)	4-GBYTE DRIVE	3
–	CIPRICO (RAID)	POWER SUPPLY	2
–	CIPRICO (RAID)	DISPLAY PANEL	3
–	CIPRICO (RAID)	POWER SWITCH	3
–	CIPRICO (RAID)	FAN	3
–	CIPRICO (RAID)	FILTER	3
–	CIPRICO (RAID)	OVER TEMP. SENSOR (45)	3
–	CIPRICO (RAID)	OVER TEMP. SENSOR (50)	3
–	BOX HILL MDL1C-7	SCSI SE TO DIFF. SCSI CONVERTER	1

LPS Consent to Ship Review

Software Maintenance

- **Software Maintenance**
  - **Oracle Maintenace silver support is provided for strings 1 throug 5.**

LPS String	S/N	MODEL #	MAINT ENDS	COST/yr
LPS001		CSI 1108277	1/30/98	$1168
LPS002		CSI 1108277	1/30/98	$1168
LPS003		CSI 1108277	1/30/98	$1168
LPS004		CSI 1108277	1/30/98	$1168
LPS005		CSI 1108277	1/30/98	$1168
LPS005		CSI TBD	TBD	$TBD
			Total	$5840

LPS Consent to Ship Review

Agenda

- Introduction
- System Configuration
- Maintenance/Hardware Support Items
- System Performance Review
- System Test Status Report
- Software Support Items
- Documentation
- Training
- Facility Status (EDC)
- Open Issues/Work-Off Plans
- Conclusion
- Backup Slides

Wideband Data Receipt

Requirement: Receive at 75 Mbps

Test Results: 75 Mbps achieved for all tests

Requirement: Introduce <1 bit error in 10^9 bits

Test Results: 2 - 4 bit errors in 10^9 bits
average over 7 one-scene captures (~300 MB each)

Transfer to ECS

Performance not tested

Data Processing

Requirement: Retrieve at 7.5 Mbps per string

Test Result:s: Including some processing -

~8.2 Mbps/string - 3 contacts, single scenes, Format 1

~12.6 Mbps/string - 3 contacts, single scenes, Format 2

Requirement: Process at 12 Mbps aggregate (3 Mbps/string)

Test Results:

~2.5 Mbps/string - 1 contact, single scene, Format 1

~3.7 Mbps/string - 1 contact, single scene, Format 2

~5.9 Mbps/string - 3 contacts, single scenes Format 1

~10.2 Mbps/string - 3 contacts,single scenes, Format 2

~6.8 Mbps/string - 4 contacts, single scenes, Format 1

~1.0 Mbps/string - 1 contact, 3 Format 1 scenes, large gap

Major Functionality Verified

- Ingest/Propagation/Editing of calibration parameters
- Ingest/Propagation/Editing of Contact Schedules
- Editing of message thresholds
- Display of journal messages
- Manual data capture with or without database available
- Automatic data capture
- Restaging of raw wideband data from tape
- Generation of tape labels
- Generation of band, calibration, metadata, MSCD, PCD, and browse files
- Generation of moving window display
- Report generation
- Output data transfer protocol

Major Limitations Identified (# indicates workaround in place)

- Multiple subintervals in a single contact cause a system deadlock (ICCR 970289, Build 4)
- Some, or all, Level 0R output files are not generated for some test data files. (Multiple ICCRs, Build 5)
- Scan direction is incorrect in band, calibration, and browse files and moving window display (ICCR 970308, Build 4)
- The system time must be GMT (non-problem)

The DDN server must be shutdown manually (ICCR 970295, Build 5)

- Reports contain incomplete and/or inaccurate information and cannot be printed (multiple ICCRs, Build 5)

Captures based on contact schedules have to be stopped manually. (ICCR970293, Build 5)

- MFPS cannot handle EOC without a valid major frame (??)
- The first major frame in each contact, and major frames with line sync errors, EOL errors, or time code errorsare not processed (ICCR960 073 and 970198, Build 5)
- Negative values of FHSERR and SHSERR in the MSCD file are incorrect (ICCR960074, Build 4)

Major Limitations Identified

- **Subintervals containing more than two scenes may cause system failure. (ICCR970289, Build 4)**
- **ACCA scores are not correct. (ICCR970275 and 970283, Build 5)**

Output files cannot be manually deleted via the User Interface. (ICCR970242, Build 5)

- **The automatic deletion of output files cannot be overridden. (ICCR970251, Build 5)**
- **Electing to suspend DAN processing prevents data from being sent at a later time. (ICCR970250, Build 4)**

rdc_Transmit sends garbled data (ICCR970272, Build 5)

Data can't be saved to tape (ICCR970266, Build 5)

rdc_Terminate does not work from the user interface (ICCR970268, Build 5)

Information is not aligned properly on tape labels (ICCR970277 and 970260, Build 5)

- **Scene corners are calculated incorrectly (ICCR970153 , Build 4)**
- **The scene stop time is incorrect for the last scene in each subinterval. This causes the corresponding browse image to be short. (ICCR0306, Build 4)**

LPS Consent to Ship Review

Agenda

- Introduction
- System Configuration
- Maintenance/Hardware Support Items
- System Performance Review
- System Test Status Report
- Software Support Items
- Documentation
- Training
- Facility Status (EDC)
- Open Issues/Work-Off Plans
- Conclusion
- Backup Slides

LPS Consent to Ship Review

Requirements Status

F&PS Req.	Requirement Summary	Release 2 Status	Comments
3.1. 1	support operations 24 hours per day, 7 days per week	not tested	
3.1. 2	support Landsat 7 operations for a minimum mission life of 5 years	not tested	
3.1. 3	receive, record and process 4 simultaneous wideband data inputs	not tested	
3.1. 4	process wideband data inputs from LGS on a Landsat 7 contact period basis	pass	
3.1. 5	process wideband data to generate LPS output files on a received sub-interval basis	pass	for single subintervals
3.1. 6	generate Landsat 7 return link quality and accounting data on a Landsat 7 contact period basis	pass	
3.1. 7	generate Level 0R quality and accounting data on a sub-interval basis	pass	for single subintervals
3.1. 8	reprocess wideband data	pass	
3.1.10	provide an interactive intervention capability to detect and correct abnormal system conditions	pass	
3.1.10.1	provide a system start-up capability	pass	
3.1.10.2	provide a system shut-down capability	pass	
3.1.10.3	generate and report LPS error messages	pass	
3.1.10.4	isolate system faults	pass	
3.1.10.5	recover from system faults	pass	
3.1.10.6	to test LPS functions and external interfaces	fail	rdc_Transmit sends garbled data
3.1.10.7	execute diagnostic tests	fail	rdc_Transmit sends garbled data
3.1.10.8	support end-to-end testing of LPS functions	fail	rdc_Transmit sends garbled data

LPS Consent to Ship Review

Requirements Status

3.1.11	control LPS operations	fail	several manual override functions don't work properly
3.1.12	monitor LPS operations	pass	
3.1.14	configure system resources to support LPS operations	pass	requires an operational procedure
3.1.19	provide monitoring test points and indicators	pass	
3.1.20	support software maintenance during LPS normal operations	pass	requires an operational procedure
3.1.21	permit corrective maintenance	pass	requires an operational procedure
3.1.22	support preventive maintenance during LPS normal operations	pass	requires an operational procedure
3.1.23	support operator training during LPS normal operations	pass	requires an operational procedure
3.2.1	interface with the LGS	pass	
3.2.2	interface with the LP DAAC	pass	
3.2.3	interface with the MOC	pass	if system clock is set to GMT
3.2.4	interface with the IAS	pass	using CPF generated by LPS development
3.3.1. 1	receive return link wideband data from LGS on a Landsat 7 contact period basis	pass	
3.3.1. 2	receive return link wideband data inputs from LGS on an LGS output channel basis	pass	
3.3.1. 3	store return link wideband data on a Landsat 7 contact period basis	pass	

LPS Consent to Ship Review

Requirements Status

3.3.1. 4	store return link wideband data on an LGS output channel basis	pass	
3.3.1. 5	retrieve stored return link wideband data on a Landsat 7 contact period basis	pass	
3.3.1. 6	retrieve stored return link wideband data on an LGS output channel basis	pass	
3.3.1. 7	record return link wideband data to removable storage media	fail	Copy to tape function doesn't work
3.3.1. 8	save removable storage media recorded with return link wideband data	pass	requires an operational procedure
3.3.1. 9	retrieve return link wideband data from removable storage media	pass	
3.3.1.10	generate an LPS wideband data receive summary	fail	contains incomplete/incorrect information
3.3.1.10. 1	forward the wideband data receive summary to the MOC	pass	via voice, not FAX
3.3.1.11	coordinate the receipt of return link wideband data with LGS	pass	requires an operational procedure
3.3.1.12	maintain return link wideband data receipt capability during contact period anomalies	pass	
3.3.1.13	coordinate resolution of all data transfer problems with LGS	pass	requires an operational procedure

LPS Consent to Ship Review

Requirements Status

3.3.2. 1	perform CCSDS AOS Grade-3 service on all received wideband CADUs	pass	
3.3.2. 2	perform CADU synchronization on all received wideband data	pass	
3.3.2. 3	detect and synchronize on both normal and inverted polarity wideband data	pass	
3.3.2. 4	utilize a Check/Lock/Flywheel strategy for synchronization	pass	
3.3.2. 5	invert all bits of each CADU detected to have inverted polarity	pass	
3.3.2. 6	recover from bit slips	pass	
3.3.2. 7	perform pseudo-random (PN) decoding of all received VCDUs	pass	
3.3.2. 8	store all CADUs which have failed CCSDS	pass	
3.3.2. 9	perform BCH error detection and correction on mission data zone in the VCDU	pass	
3.3.2. 9.1	perform BCH error detection and correction on the data pointer zone in the VCDU	pass	
3.3.2.10	store all CADUs which have failed BCH on the mission data zone	pass	
3.3.2.11	start a new sub-interval on detection of a change in the VCID	fail	LPS hangs at start of new subinterval
3.3.2.12	delete fill VCDUs	fail	Level 0R processing failed for file containing fill VCDUs
3.3.2.13	collect and store Landsat 7 return link (input) quality and accounting data	pass	

LPS Consent to Ship Review

Requirements Status

3.3.2.14	locate ETM+ minor frames in each received VCDU	pass	
3.3.2.15	perform ETM+ major frame synchronization using ETM+ minor frames	pass	
3.3.2.16	band deinterleave Format 1 ETM+ data	pass	
3.3.2.17	band deinterleave Format 2 ETM+ data	pass	
3.3.2.18	reverse the order of data for ETM+ reverse scans	fail	Since MSCD frames are used to determine scan direction, forward scans are reversed
3.3.2.19	fill full and partial major frames with preselected values	partial pass	full frames only
3.3.2.20	extract Mirror Scan Correction Data (MSCD) on an ETM+ major frame basis	fail	negative values are interpreted incorrectly
3.3.2.21	extract calibration data on an ETM+ major frame basis	pass	
3.3.2.22	perform integer-pixel alignment for each ETM+ band using sensor alignment information	pass	
3.3.2.23	determine ETM+ data sub-intervals	fail	software hangs on subinterval change
3.3.2.24	process wideband data to Level 0R	pass	
3.3.2.25	generate ETM+ Image data, PCD, MSCD, and Calibration data on a received sub-interval basis	pass	for single subintervals
3.3.2.26	generate Level 0R quality and accounting data	partial pass	item r conflicts with DFCB
3.3.2.27	provide data quality info per major frame	pass	
3.3.2.28	append the status data contained in the VCDU mission data zone	pass	
3.3.2.29	identify the presence of calibration door activities	not fully tested	

LPS Consent to Ship Review

Requirements Status

3.3.3.1	generate browse data for each ETM+ image scenes identified by LPS	fail	last browse file is short, can't generate more than 2 browse files per contact
3.3.3.3	generate multiband browse data from three predetermined bands of ETM+ Format 1 scene data	pass	
3.3.3.4	generate browse data for each scene	pass	
3.3.3.5	generate browse data using a predetermined reduction factor	pass	
3.3.4. 1	synchronize on PCD bytes for assembling PCD minor frames	pass	
3.3.4. 2	fill missing PCD data	unable to verify	test data was inadequate
3.3.4. 3	assemble PCD major frames	pass	
3.3.4. 4	generate PCD file(s) on a sub-interval basis	pass	for single subintervals
3.3.4. 5	collect and store PCD quality and accounting, Processed PCD quality and accounting data ,Last instrument on/off times, on a subinterval basis	pass	for single subintervals
3.3.4. 7	perform ETM+ scene identification in accordance with the WRS scheme	pass	if data includes sufficient PCD
3.3.4. 8	perform automatic cloud cover assessment (ACCA) for WRS scenes	fail	scores are too low
3.3.4. 9	perform ACCA on both scene quadrant and full scene basis	fail	value for full scene calculated as sum of quadrants
3.3.4.10	use parameterized comparison values in performing ACCA	fail	scores are too low
3.3.4.11	generate Level 0R metadata (ancillary data) file(s) on a sub-interval basis	pass	for single subintervals
3.3.4.12	generate and include in each Level 0R metadata file the listed Level 0R information, on a subinterval basis	pass	for single subintervals

LPS Consent to Ship Review

Requirements Status

3.3.4.13	generate and include in each Level 0R metadata file listed image quality data, on a scene basis	partial pass	items b, d, and h conflict with DFCB
3.3.4.14	generate and include in each Level 0R metadata file listed PCD quality and accounting data, on a scene basis	pass	
3.3.4.15	generate and include in each Level 0R metadata file listed processed PCD quality and accounting data, on a scene basis	pass	
3.3.4.16	generate and include in each Level 0R metadata file listed data for each WRS identified scene	fail	values calculated incorrectly
3.3.5.1	notify LP DAAC on the availability of LPS files	pass	
3.3.5.2	coordinate the reporting of file transfer problems with the LP DAAC	pass	
3.3.5.3	receive notification from LP DAAC on the successful receipt of transferred LPS files	pass	
3.3.5.4	store LPS data files until confirmation of successful transfer is received from the LP DAAC	pass	
3.3.5.5	provide a manual override and protected capability to delete all LPS files on a specific contact period basis	fail	manual delete function does not work
3.3.5.6	provide a manual override and protected capability to retain all LPS files on-line on a specific contact period basis	fail	output files deleted automatically following successful transfer to ECS
3.3.5.7	generate LPS file(s) transfer summary	partial pass	items f, g, h, j, o, and p are not in the report
3.3.6. 1	generate and modify LPS set-up tables from operator inputs	pass	
3.3.6. 2	collect and report Landsat 7 return link quality and accounting data on a contact period basis	fail	report contains incomplete/incorrect information
3.3.6. 3	collect and report Level 0R quality and accounting data on a sub-interval basis	pass	

LPS Consent to Ship Review

Requirements Status

3.3.6. 4	display quality and accounting data upon operator request	pass	
3.3.6. 4.1	print quality and accounting data upon operator request	fail	print function not implemented
3.3.6. 5	display LPS file(s) transfer summary upon operator request	pass	
3.3.6. 5.1	print LPS file(s) transfer summary upon operator request	fail	print function not implemented
3.3.6. 6	allow the operator to select thresholds for results and errors reported by the LPS	pass	
3.3.6. 7	automatically generate messages and alarms to alert the operator of LPS results and errors exceeding selected thresholds	pass	
3.3.6. 8	manually override the LPS automated functions	fail	several manual override functions don't work properly
3.3.6. 9	selectively enable and/or disable Receive Wideband Data, Generate Level 0R Files, Transfer LPS Files functions	partial pass	can't suspended DANs aren't saved for later transfer
3.3.6.10	provide a moving window display capability	pass	
4.1. 3	receive and process the equivalent of 250 Landsat 7 ETM+ scenes of wideband data per day (approximately 100 GB per day)	not tested	
4.1. 4	move to 30 day storage and process the daily volume of wideband data within 16 hours of its receipt at LPS	fail	copy to tape function doesn't work
4.1. 5	reprocess a maximum of 10 percent of the daily input volume of wideband data (approximately 25 scenes or 10 GB per day)	not tested	
4.1. 6	process received wideband data at an average aggregate rate of 12 Mbps	pass	if multiple contacts are processed concurrently
4.1. 7	provide on-line storage for temporary retention of LPS files for a maximum of 8 hours	not tested	
4.1. 8	introduce no more than one bit error in 10^9 bits	fail	2 - 4 bit errors in 10^9

LPS Consent to Ship Review

Requirements Status

4.1. 9	maintain data processing throughput performance	not tested	
4.1.10	provide at least 110% of the processing throughput capability required	not tested	
4.1.11	provide at least 125% of the random access memory required	not tested	
4.1.12	provide at least 125% of the peripheral storage capacity required	not tested	
4.1.13	provide at least 110% of the input/output band width required	not tested	
4.2.1	capability of transferring wideband data at a maximum rate of 75 Mbps per LPS input	pass	
4.2.2	transfer the daily volume of LPS output files to LP DAAC at an average aggregate rate of 40 Mbps	unable to test	need ECS and operational network
4.3.1	receive wideband data for Landsat 7 contact periods of up to 14 minutes	not tested	
4.3.2	store wideband data for at least three contact periods for each LGS input	not tested	
4.3.3	retrieve stored wideband data at rates equal to or greater than 7.5 Mbps for each input	not tested	
4.3.4	generate browse data with a reduction factor of 16 or better	pass	
4.3.5	identify ETM+ WRS scenes within an accuracy of 30 meters	fail	scene corners are calculated incorrectly
4.3.6	retain return link wideband data storage media for 30 days	pass	requires an operational procedure
4.4.1	provide an Operational Availability (Ao) of 0.96 or better for all processing functions	not tested	
4.4.2	support a mean time to restore (MTTRes) capability of 4 hours or better	not tested	
4.4.3	not exceed twice the required MTTRes in 99 percent of failure occurrences	not tested	

LPS Consent to Ship Review

Agenda

- Introduction
- System Configuration
- Maintenance/Hardware Support Items
- System Performance Review
- System Test Status Report
- **Software Support Items**
- Documentation
- Training
- Facility Status (EDC)
- Open Issues/Work-Off Plans
- Conclusion
- Backup Slides

LPS Consent to Ship Review

Support Tools:
Data Transmission

Function	Description
rdc_vmereset	**Resets the VME Bus**
hpdixmi	**Transmits a data file through the HPDI device**

Support Tools:
ECS Interface

Function	Description
dss_ui	**Simulate file transfers**
ecs_sim	**Simulate ECS**

Support Tools:
Output File V&V

Function	Description
EOSView	**View LPS output files**
vshow	**View LPS output files**
readPCDlps	**View LPS PCD files**
hdfzjpeg	**View LPS browse files**
xv	**View LPS browse files**
readPCDlps	**View LPS PCD files**

LPS Consent to Ship Review

Support Tools:
Data Manipulation

Function	Description
decodetime	Extract time from a file
cppart	Edit a data file: split into smaller files, remove data
flipbits	Introduce/correct bit flips in data
gtdump	Describes contents of data; used to compare contents of data files
gtedit	Browse/edit binary data files, including LPS Trouble Files
locslip	Left/right shift data, and introduce a bit pattern into data.
pne	Psuedo-Random Noise Encoder/decoder

Support Tools:
Database Manipulation

Function	Description
look_db	View LPS database; list and select tables
teststart	Prepare the LPS/test environment for a new test
teststop	Extract database, journal file information, and trouble files associated with the test

LPS Consent to Ship Review

Agenda

- Introduction
- System Configuration
- Maintenance/Hardware Support Items
- System Performance Review
- System Test Status Report
- Software Support Items
- Documentation
- Training
- Facility Status (EDC)
- Open Issues/Work-Off Plans
- Conclusion
- Backup Slides

LPS Consent to Ship Review

Documentation Status

LPS Documents	Release 2 Status	Baseline Date	Comments/ Work Off Plans
LPS F&PS	Complete	July 31, 1996	
LPS Operations Concept	TBD		
IAS LPS ICD	Complete	July 29, 1996	
LGS LPS ICD R2	Complete	July 7, 1997	
LPS Output File Format Data Control Book	Complete	Nov 14, 1997	
LPS MOC MOU	Complete	June 1997	
LPS Build Implementation Plan	Complete	Sept 13, 1997	
LPS Transition Plan	Complete	June 30, 1997	
LPS Installation Plan	TBD	July 21, 1997	
LPS O&M Manual	TBD	July 21, 1997	
LPS Software Configuration Guide	Complete	July 1997	
LPS Software Requirements Specification	Review Final	July 1997 Aug 11, 1997	
LPS As Built Specification	Review Final	July 1997 Aug 22, 1997	
LPS Interface Definitions Document	Complete	Oct 1996	
LPS User's Guide Release 2 Volume 1	Complete	July 1997	
LPS User's Guide Release 2 Volume 2	Final	July 28, 1997	
LPS Programmer's Reference Manual	Review Final	July 28, 1997 Aug 22, 1997	

LPS Consent to Ship Review

Agenda

- Introduction
- System Configuration
- Maintenance/Hardware Support Items
- System Performance Review
- System Test Status Report
- Software Support Items
- Documentation
- Training
- Facility Status (EDC)
- Open Issues/Work-Off Plans
- Conclusion
- Backup Slides

LPS Consent to Ship Review

Training

- Operator/Hardware Maintenance Training
  - Formal Operator Training will be provided in first quarter of FY98
    - FY97 Operator Training budgets were cut from LPS budget
    - LPS Hardware Maintenance Package was prepared prior to budget cut and with civil servant support
    - FY98 Plan will include remaining Operator Training course/ materials preparation and presentation
  - GSFC will provide additional necessary support to operations prior to completion of formal training
    - GSFC will provide on-site support prior to and during ground system I&T tests
    - EDC to document support requirements for I&T and any other known activities
- Software Maintenance Training
  - Training will be provided in FY98 as outlined in the LPS Transition Plan

LPS Consent to Ship Review

Agenda

- Introduction
- System Configuration
- Maintenance/Hardware Support Items
- System Performance Review
- System Test Status Report
- Software Support Items
- Documentation
- Training
- **Facility Status (EDC)**
- Open Issues/Work-Off Plans
- Conclusion
- Backup Slides

LPS Consent to Ship Review

Facility Status

Slides to be provided by EDC

LPS Consent to Ship Review

Agenda

- Introduction
- System Configuration
- Maintenance/Hardware Support Items
- System Performance Review
- System Test Status Report
- Software Support Items
- Documentation
- Training
- Facility Status (EDC)
- Open Issues/Work-Off Plans
- Conclusion
- Backup Slides

LPS Consent to Ship Review

Open Issues/Work-Off Plans

Problem	Work Off Plan
250 Mhz CPU UPGRADE	· **CPU upgrade components were received on 7/18/97.** · **Upgrade to strings 1 and 5 will be completed and tested prior to shipping**
INDY SYSTEM DISK UPGRADE	· **System disk upgrade components were received on 7/18/97.** · **Upgrade to L7INDY3, 8, and 9 will be completed and tested prior to shipping**
CIPRICO RAID POWER SUPPLY UPGRADE	· **Ciprico Technician will be at GSFC on 7/22 and 7/23 to upgrade all RAIDS to latest power supply design.** · **Internal baffles will be changed to provide increased cooling.**
GENERAL STANDARDS CORP. HPDI/VSIO CARD **Bit flip problem remains unresolved. Problem has yet to be duplicated in vendors environment. Trouble shooting is continuing. Error rate induced is approximately 1 bit flip in 10 GBITS.**	· **LPS requirement for induced error is no more than 1 bit error in 10 GBITS.** · **SOLUTION#1: Vendor discovers solution, all HPDI/VSIO cards are returned to vendor for no cost repair.** · **SOLUTION#2: Error rate is typically lower than requirement. Error correction S/W will correct errors resulting in near zero induced error.**

LPS Consent to Ship Review

Open Issues/Work-Off Plans

Problem	Work Off Plan
HPDI/VSIO CARD CONTINUED **PROBLEM: HPDI/VSIO card transmit function is non-functional if a clock is supplied to the input side of the transmitting card during the transmission of data.**	· **Solution #1: Minor, post delivery change to on-board firmware to allow the independent gating of playback and capture clock signals. Minor change (10 LOC) to controlling S/W to be included in release 4.** · **Solution #2: Implement operational procedures which ensure that a clock signal is never sent to a HPDI/VSIO card while it is transmitting data.**
HPDI/VSIO SPARING **PROBLEM: Removal of $50K from LPS H/W budget has resulted in the procurement of 6 spare HPDI/VSIO cards instead of the planned 10.**	· **Solution #1: Recovery of $50K in next fiscal year should allow for procurement of 4 more cards to bring total spares up to 10.**
Build, installation, & configuration procedures for VSIO boards	· **SGI and General Standards to provide documentation prior to installation of LPS at EDC. S/W related configuration items will be included in the LPS S/W configuration guide.**
Source Code for VME RESET	· **Source code for VME reset function has been acquired, compiled, and tested successfully.**
VSIO Test Tools	· **Selected test tools specifically designed to exercise and debug General Standards VSIO cards will be provided in the usr/LPS/AT/TOOLS/VSIO_TOOLS directory on each string. C source code and executables will be provided.** · **These tools are not part of any formal delivery.**
Resolve training funding issues	
Verify a Complete System Build Procedure	
Document NTP	

LPS Consent to Ship Review

Agenda

- Introduction
- System Configuration
- Maintenance/Hardware Support Items
- System Performance Review
- System Test Status Report
- Software Support Items
- Documentation
- Training
- Facility Status (EDC)
- Open Issues/Work-Off Plans
- Conclusion
- Backup Slides

LPS Consent to Ship Review

Conclusion

- **LPS Release 2.1 (Build 4) will provide support for the I&T 4b scheduled for October except for ACCA scoring requirement (see test matrix)**
- **LPS Release 3 (Build 5) will be the launch support release**

LPS Consent to Ship Review

I&T 4 Requirement Summary

Requirement Number	Ref. Number		Test Objectives (to verify)		Met w/ LPS Release 2.1
6200.01 The LPSSf shall provide CCSDS AOS Grade 3 services to handle receipt of wideband data from LGS	LPS01	V	Wideband Data		Y
6200.01.01 The LPSf shall be capable of receiving the equivalent of 250 ETM+ scenes of W/B data /day from the LGS which will consist of a combination of data from local satellite passes and data received from other LGN sites	LPS02	V	ETM+ Data 250 scenes/day		Y
6200.01.03 The LPSf shall provide statistics and quality data to the MOC as documented in the LPS-MOC MOU	LPSL03	V	Data Quality Statistics		Y
6200.02 The LPSf shall process all wideband data received to level zero R, within 16 hours after receipt of the last data in a return link session, on a subinterval basis	LPS04	V	Level 0R Data (16 hours)		Y
6200.02.03 The LPSf shall retain the raw wideband data for a minimum of 30 days from time of receipt	LPS05	V	ETM+ Data Archive (30 days)		
6200.02.04 The LPSf shall perform BCH error detection and correction decoding	LPS06	V	LPS Internal Report		Y
6200.02.05 The LPSf shall provide the capability to schedule, replay, and reprocess up to 10 percent of a day's raw wideband data on a daily basis	LPS07	V	10% Level 0R data/day		Y
6200.03 The LPSf shall provide level zero R data to the EDC DAAC	LPS08	V	Level 0R data		Y
6200.04 The LPSf shall provide browse data on a scene basis	LPS09	V	Browse Data		Y
6200.05 The LPSf shall provide metadata and browse data to the EDC DAAC with each level 0R archive entry to include information to describe at a minimum the following	LPS10	V			Y

LPS Consent to Ship Review

I&T 4 Requirement Summary (cont)

6200.06 The LPSf shall generate metadata on a subinterval basis with the metadata containing scene information	LPS 11	V	Scened metadata		Y
6200.06.01 The LPSf shall identify scene boundaries (WRS reference on corner coordinates) for each scene within the associated metadata for each subinterval of level zero R data	LPS12	V	Scene Boundaried metadata		? Verify if fix for this is in Build 4
6200.06.02 The LPSf shall perform cloud cover assessment	LPS13	V	Cloud cover Assessment via Metadata		No ACCA is not providing proper scores will be fixed in Release 3
6200.06.03 The LPSf shall provide return-link quality and accounting information for all wideband data as part of the metadata	LPS14	V	Quality/Acconuting Information via metadat		Y
6200.08 The LPSf shall coordinate with the EDC DAAC regarding the availability of level zero R data, metadata, and browse data, and the successful transfer of the data	LPS15	V	Data Coordination		Y
6200.09 The LPSf shall receive reprocessing requests and processing parameters from the IASf, as specified in the LPS-IAS ICD	LPS16	V	Reprocessing Requests/Processing Parms		Y
6200.11 The LPSf shall provide the capability to store LPS data files until confirmation of successful transfer is received from the EDC DAAC	LPS18	V	Data File Storage		Y
6200.13 The LPSf shall introduce no more than one bit error in 10**9 bits processed	LPS19	V	BER 10**9 forwarded		Y
6200.14 The LPSf shall be capable of recording 14 minutes of wideband data per return link per session	LPS20	V	ETM+ Data Archive		Y
6200.25 The LPSf shall produce indicators of system performance and data quality	LPS21	V	Quality Report/Error Log Journal/Trouble File		Y
6200.25.01 The LPSf shall collect performance and quality data and deliver it with the metadata	LPS22	V	Metadata/Performance Data/Quality Data		Y
6200.25.02 The LPSf shall provide for display of system performance and data quality and make them available to the system operators	LPS23	V	System Performance Data Display		Y

LPS Consent to Ship Review

Conclusion

- **Review of Action Items**
- **Review of Desicion to Ship**

LPS Consent to Ship Review

Action Items

- **Add tracking and review of these action items to the LPS PCMB agenda (Joy)**
- **Provide LPS FY98 planning changes to the L7 Project (Joy)**
  - **Additional funding for assuming FY98 Hardware Maintenance**
  - **Additional funding for Operator Training which was moved from FY97**
- **Provide plan for closure of CCRs/ICCRs that were identified as fixed but not delivered with LPS Release 2. Receive EDC concurrence on plan. (Joy)**
- **Provide final list of CCRs/ICCRs to be provided in Build 4 (Joy)**
- **Provide final list of CCRs/ICCRs to be provided in Build 5 (Joy)**
- **Present approved schedules for Build 4 and Build 5 (Joy)**
- **Resolve operations support needed prior to completion of Ops Training in FY98 (Darla/Joy)**

LPS Consent to Ship Review

Agenda

- Introduction
- System Configuration
- Maintenance/Hardware Support Items
- System Performance Review
- System Test Status Report
- Software Support Items
- Documentation
- Training
- Facility Status (EDC)
- Open Issues/Work-Off Plans
- Conclusion
- Backup Slides